

WHAT IS CLAIMED IS:

- 1 1. A method of determining the position of a tire on a vehicle using
2 signal pulses, comprising:
3 receiving a plurality of signal pulses from a transmitter
4 associated with the tire in the time the tire completes approximately one
5 rotation;
6 providing at least one predetermined signal pattern associated
7 with a unique tire position on the vehicle; and
8 comparing the plurality of signal pulses to the predetermined
9 signal pattern to determine the position of the tire on the vehicle.
- 1 2. The method of claim 1, further including transmitting the plurality
2 of signal pulses using a duty cycle represented as a percentage time of a
3 transmission cycle.
- 1 3. The method of claim 2, wherein duration of the transmission
2 cycle is less than the time the tire completes one rotation at travelling speeds.
- 1 4. The method of claim 1, further including determining the timing
2 of transmission for the plurality of signal pulses.
- 1 5. The method of claim 4, wherein determining the timing
2 transmission for the plurality of signal pulses includes synchronizing a
3 receiver with the transmitter.
- 1 6. The method of claim 5, wherein synchronizing the receiver with
2 the transmitter includes applying a low-pass filter to an oversampled signal.
- 1 7. The method of claim 1, wherein comparing the plurality of signal
2 pulses to the predetermined signal pattern includes determining a signal
3 strength for each of the plurality of signal pulses, wherein the predetermined
4 signal pattern is a pattern of signal strengths.

1 8. The method of claim 1, wherein comparing the plurality of signal
2 pulses to the predetermined signal pattern includes comparing a plurality of
3 characteristics of the plurality of signal pulses with a corresponding plurality of
4 characteristics of the predetermined signal patterns.

1 9. The method of claim 1, further comprising determining if a tire
2 has changed position on the vehicle based on comparing the plurality of
3 signal pulses to the predetermined signal pattern.

1 10. A system for determining the position of a tire on a vehicle using
2 a periodically transmitted signal, the system comprising:

3 a transmitter circuit associated with the tire configured to
4 transmit a plurality of signal pulses in the time the associated tire completes
5 approximately one rotation;

6 a receiver circuit configured to receive the plurality of signal
7 pulses;

8 a memory configured to store a plurality of predetermined signal
9 patterns, each predetermined signal pattern associated with a unique tire
10 position on the vehicle; and

11 a processing circuit configured to compare the plurality of signal
12 pulses to at least one of the predetermined signal patterns, and to determine
13 the position of the tire on the vehicle based on the comparison.

1 11. The system of claim 10, wherein the receiver circuit is
2 configured to determine the time of transmission for the plurality of signal
3 pulses.

1 12. The system of claim 11, wherein the time of transmission is
2 determined by synchronizing the transmitter circuit and receiver circuit.

1 13. The system of claim 12, wherein the receiver circuit is
2 configured to synchronize with the transmitter circuit using a hardware
3 comparator.

1 14. The system of claim 12, wherein the processing circuit is
2 configured to perform synchronization based on the application of a low-pass
3 filter applied to an oversampled signal.

1 15. The system of claim 10, wherein the receiver circuit is
2 configured to compare a plurality of characteristics of the plurality of signal
3 pulses with a corresponding plurality of characteristics of a predetermined
4 signal pattern.

1 16. The system of claim 10, wherein the plurality of pulsed signals
2 includes at least 10 pulsed signals in the time the tire completes the
3 approximately one rotation.

1 17. The system of claim 10, wherein the processor circuit is
2 configured to determine if the tire has changed position on the vehicle based
3 on the comparison of the plurality of pulsed signals to the predetermined
4 signal patterns.

1 18. A system for determining the position of a tire on a vehicle using
2 a plurality of signal pulses, the system comprising:
3 a memory configured to store a plurality of predetermined signal
4 patterns, each predetermined signal pattern associated with a unique tire
5 position on the vehicle; and
6 a circuit configured to determine the times of transmission of the
7 plurality of signal pulses, to detect the plurality of signals at approximately the
8 determined times, to compare the plurality of signal pulses to at least one of
9 the predetermined signal patterns, and to determine the position of the tire on
10 the vehicle based on the comparison.

1 19. The system of claim 18, wherein the times of transmission are
2 determined by synchronizing the circuit with a transmitter.

1 20. The system of claim 19, wherein the processing circuit is
2 configured to perform synchronization using a hardware comparator.

1 21. The system of claim 19, wherein the processing circuit is
2 configured to perform synchronization based on the application of a low-pass
3 filter applied to an oversampled signal.

1 22. The system of claim 18, wherein the processing circuit is
2 configured to compare a plurality of characteristics of the plurality of signal
3 pulses with a corresponding plurality of characteristics of a predetermined
4 signal pattern.

1 23. The system of claim 18, wherein the plurality of pulsed signals
2 includes at least 10 pulsed signals transmitted in the time the tire completes
3 approximately one rotation.

1 24. The system of claim 18, wherein the processor circuit is
2 configured to determine if the tire has changed position on the vehicle based
3 on the comparison of the plurality of pulsed signals to the predetermined
4 signal patterns.

1 25. A method of determining the position of a tire on a vehicle using
2 signal pulses, comprising:
3 determining the times of transmission for a plurality of signal
4 pulses transmitted by a transmitter associated with the tire;
5 detecting the plurality of signal pulses at approximately the
6 determined timing;
7 determining at least one predetermined signal pattern
8 associated with a unique tire position on the vehicle; and
9 comparing the plurality of signal pulses to the predetermined
10 signal pattern to determine the position of the tire on the vehicle.

1 26. The method of claim 25, wherein determining the timing of
2 transmissions for the plurality of signal pulses includes synchronizing a
3 receiver with the transmitter.

1 27. The method of claim 26, wherein synchronizing the receiver with
2 the transmitter includes applying a low-pass filter to an oversampled signal.

1 28. The method of claim 25, wherein comparing the plurality of signal
2 pulses to the predetermined signal pattern includes determining a signal
3 strength for each of the plurality of signal pulses and the predetermined signal
4 pattern is a pattern of signal strengths.